Erosion - the break-up and transport of materials by moving natural agents: streams, glaciers, wind + waves.

Weathering — the break-up of rock mainly by exposure to the atmosphere (in place, no transport)

Types of Weathering

A. Mechanical/Physical — disintegration - rock is split or broken into smaller pieces of the same material, no change in composition.

Types of Mechanical

1. Frost action or ice wedging — freezing H_2O expands 10% and wedges rocks apart.

2. significant changes in temp (ie forest fire) can crack rocks

3. actions of plants and animals

   biological weathering { — plant roots go into cracks, wedging
   — ants, worms — dig holes

4. exfoliation - unloading of overlying rock and soil allows the rocks below to expand and crack in curved breaks → exfoliated domes

B Chemical — decomposition — rock's minerals change into different substances

Types of Chemical

different ~~....~~

Types of Chemical

1. rainwater — certain minerals (feldspars, hornblende, etc) unite with water (hydration), swell and crumble into clay.

2. oxidation — iron substances (magnetite, pyrite, hornblend, etc) combine with oxygen to form iron oxide (rust)

   iron + oxygen = hematite
   iron + water + oxygen = limonite
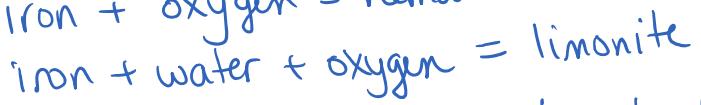
3. carbon dioxide — dissolves in water to form carbonic <u>acid</u> (natural acid rain), attacks many minerals (esp. calcite!) and dissolves some elements (K, Na, Mg, Ca) and turns minerals to clay

4. <u>acids</u> of plant/animal decay — similar to CO_2 (also biological weathering)

5. man made <u>acid</u> rain — similar effects

— Spheroidal weathering — corners are most susceptible to breaking (more surface area to attack)
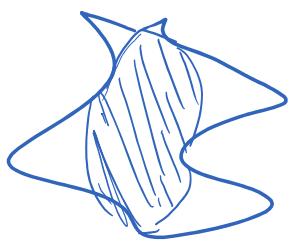
— chemical
— $\wedge$Weathering occurs fastest: hot rainy climates

— weathering forms spectacular shapes as softer rocks erode away more quickly.
~~lir ls l weathering~~

– weathering forms ?
rocks erode away more quickly.
= differential weathering

Rocks being broken up create:
Soil – broken rocks that contain organic material
(plants can grow)
- A horizon = topsoil, more organic
B horizon = subsoil, contains more clay
C horizon = slightly weathered rock on top
of bedrock.

Mind Map Summary

Mechanical
(Physical)

frost
action

Temp
changes

action
of
plants
+
animals

exfoliation

Chemical —— CO_2

rain / oxidation

acids
of
plants/animals

man-made
acid
rain

Biological